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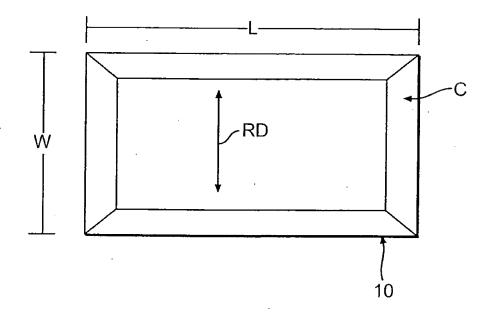


FIG. 1

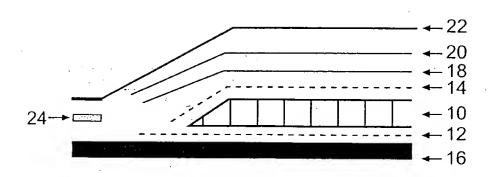


FIG. 3

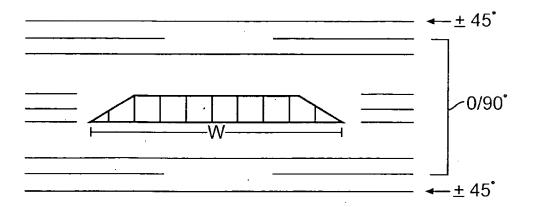


FIG. 2A

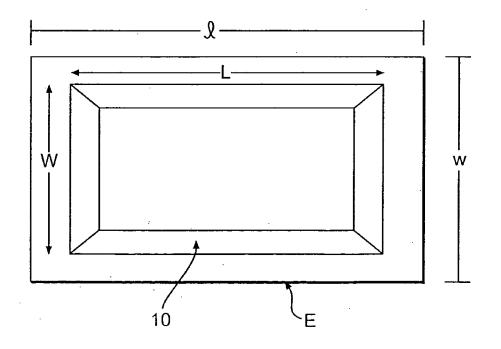
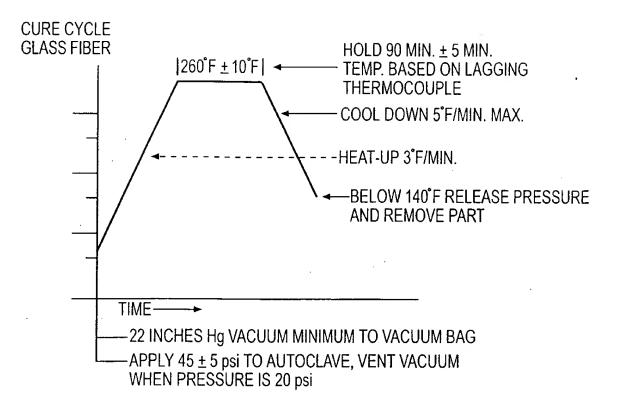
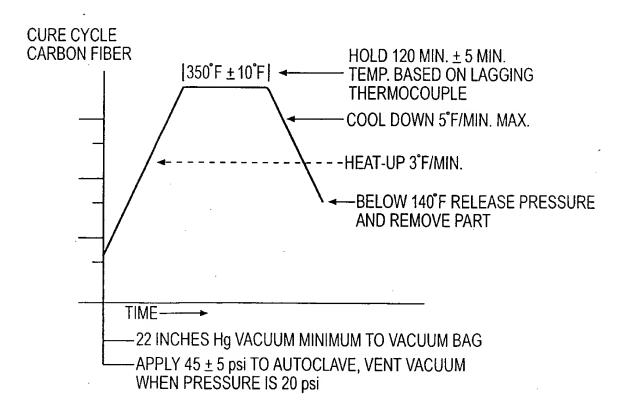


FIG. 2B



## FIG. 4A



## FIG. 4B

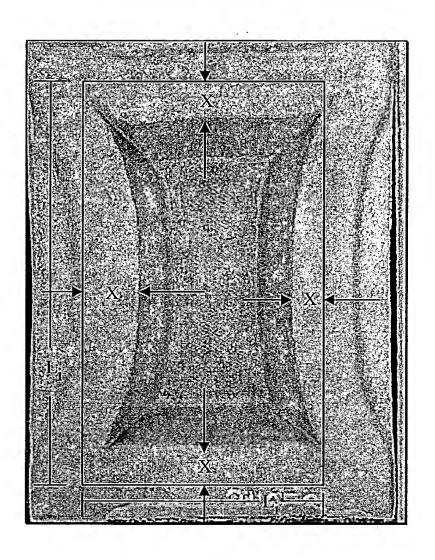


FIG. 5

#### TYPICAL SILANE COUPLING AGENT

#### A-SI-R-B

A - HYDROLYZABLE FUNCTION

Si - SILICON ATOM

R - ALKYL BRIDGING GROUP

**B-ORGANOFUNCTIONAL GROUP** 

$$CH_2CHCH_2OCH_2CH_2Si(OCH_3)_3$$

FIG. 6

#### **COUPLING AGENT CHEMISTRY**

 $\begin{array}{c} \text{R'CH}_2\text{CH}_2\text{Si}(\text{OCH}_3)_3 & \xrightarrow{\text{H}_2\text{O}/\text{MeOH}} \\ \text{HYDROLYSIS} & \\ \text{R'CH}_2\text{CH}_2\text{Si}(\text{OH})_3 & \xrightarrow{\text{SUBSTRATE-OH}} \\ \text{SUBSTRATE-O-Si}(\text{OH})_2\text{-CH}_2\text{CH}_2\text{CH}_2\text{R'} \end{array}$ 

R'= REACTIVE ORGANIC GROUP SUBSTRATE= GLASS FABRIC

FIG. 7

#### TYPICAL SILANE COUPLING AGENT

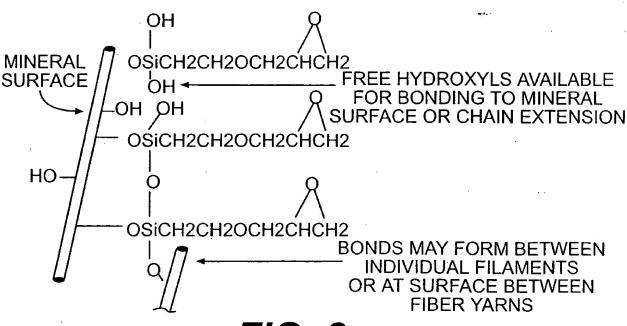


FIG. 8

#### FINISH DEPOSITS ON FIBERGLASS STRAND

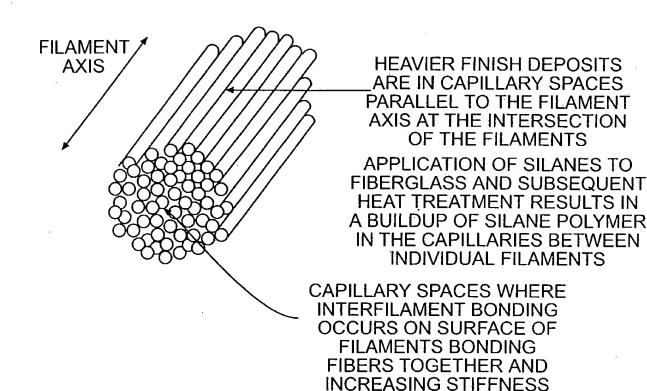
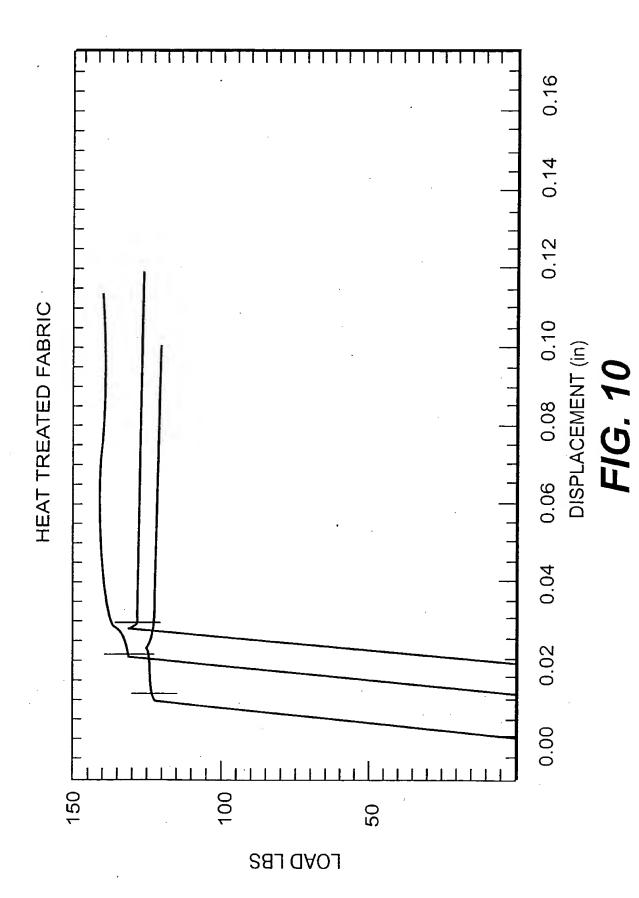


FIG. 9



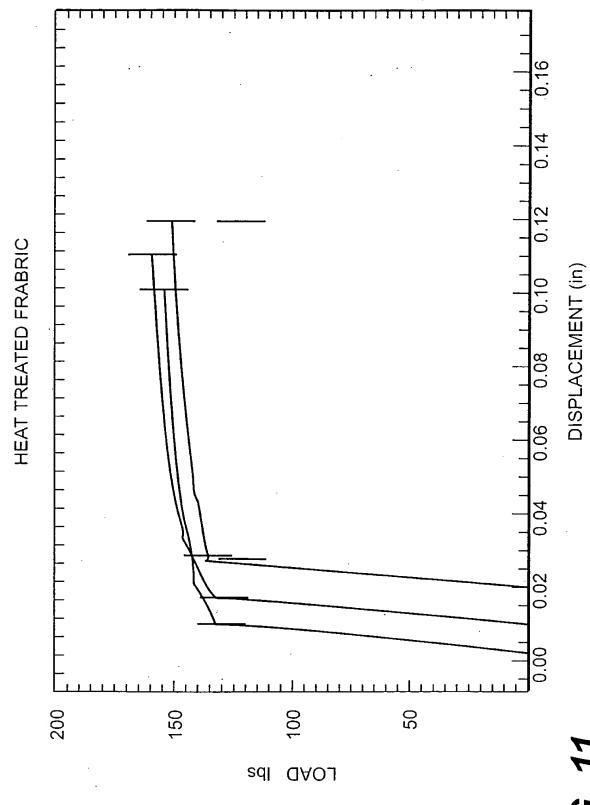


FIG. 11

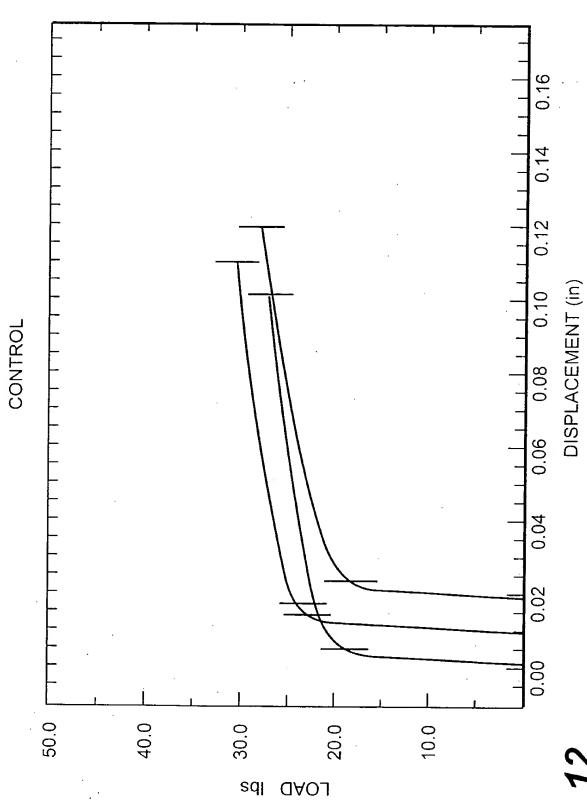


FIG. 12